

Wiedemann's Annalen der Physik und Chemie, No. 2.—Methods of determining dielectric constants, by W. Nernst. The author employs a bridge in which two branches are always equal; the third contains the dielectric trough, and the fourth a variable resistance and a variable capacity in parallel. Connecting two opposite terminals with a high-frequency induction coil, and the two others with a telephone, the latter is only silent when the resistance and the capacity in the fourth branch are equal to those of the dielectric in the third. An attempt to verify this by comparison with the electrometer method was foiled by the uncertainty of the latter.—A modification of the electrometer method, by J. F. Smale. This is based upon the attraction of a needle immersed in the dielectric by conductors kept at a constant potential. The conductors are two semi-ellipses nearly surrounding the flat needle of platinum, which is suspended by a quartz fibre. The deflection of the needle from its position of rest is proportional to the dielectric constant of the medium. A comparison with Nernst's method gave practically identical results.—An apparatus for varying self-induction, by Max Wien. This consists of a fixed and a movable coil. The fixed coil is subdivided into four, each of which can be placed in circuit, so that the self-induction can be abruptly changed. The interval between each abrupt change is filled up by moving the movable concentric coil about its diameter, by means of an arm travelling over a graduated circle. The range of the apparatus is very large, and self-inductions from 5×10^3 to 10^{10} can be measured.—Refraction and reflection of electric waves by water and alcohol, by A. D. Cole. For waves 300 to 600 cm. long, water has an index of refraction of 8.95, alcohol 5.20. Calculated by Fresnel's formula from the reflection of polarised rays, the refractive indices for wave-lengths of 5 cm. come out as 8.8 for water, and 3.2 for alcohol; so that alcohol shows a remarkably higher refraction for long than for shorter waves.—Lowest temperatures and the liquefaction of gases, by C. Linde. Air is liquefied exclusively by the action of its own expansion, each portion of the expanded air being conducted past the next expanding proportion, and cooling it down to a lower temperature. The apparatus is almost identical with that recently described by Prof. Dewar, but the author claims priority.—The wave siren, by Rudolph König. This paper contains the results of a minute and careful investigation of the behaviour of the air current in a wave-siren. The air is blown through a slit, which is lengthened or shortened by the curved edge of a plate rotating in front of it. Any tone is thus directly reproduced from its wave-form. The air current remains sharply defined to a distance of about 1 cm. from the slit, and the wave-plate need therefore not be mounted very close to it. There is no accumulation of air by the closed portions of the slit leading to irregularities in the tone, and the vortex effects at the edges are without any influence upon the tone. The loudness of the sound produced by a simple sine curve increases with the width of the slit, reaching a maximum where the width is half the wave-length. Most vowels can be correctly reproduced from their known wave-forms.

Bollettino della Società Sismologica Italiana, vol. i., 1896, No. 9.—Review of the principal eruptive phenomena in Sicily and the adjoining islands during the four months, May–August, 1895, by S. Arcidiacono.—Notices of Italian earthquakes (July–August, 1895), by M. Barratta, the more important being those of the Comacchio earthquake of July 30, and part of those of the Adriatic earthquake of August 8.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, January 30.—“On the Rhythmic Contractility of the Spleen.” By E. A. Schäfer, F.R.S., and B. Moore.

The authors have investigated the rhythmic contractility of the spleen, which was discovered by Roy (*Journ. Physiol.*, vol. iii.), and the influence of nerves, drugs, and animal extracts upon it. For this purpose the changes in its volume have been studied by aid of a specially constructed plethysmograph, so arranged as to afford the least possible obstruction to the blood-vessels entering and leaving the hilum. Under these circumstances, the spleen exhibits evidence of responding immediately by alterations in volume to every alteration in blood pressure, respiratory and cardiac, and *à fortiori* to such greater changes as

are produced by compression of the aorta (contrary to Roy). This is even manifest when the organ is left connected with the rest of the vascular system by one artery and vein only. The conclusion which Roy arrived at, that the spleen is practically cut off from the arterial system, and that its circulation is maintained by its own contractions, is thus shown to be incorrect.

The rhythmic contractions are independent of the central nervous system.

They are excited to increased activity by intravenous injection of certain drugs and animal extracts which act specifically upon the organ. Indifferent fluids, such as normal salt solution, produce in moderate quantity no such effects (contrary to Roy).

Dyspnoea causes marked contraction of the spleen. This contraction is of central origin, for after severance of all nerves to the organ it is replaced by a passive dilatation, due to the rise of general blood pressure, followed by an increase in extent of the rhythmic contractions. Temporary cessation of the blood flow through the organ also has the effect of increasing their extent, probably because the splenic tissue is thereby deprived of oxygen.

The splanchnics contain not only nerve fibres which produce contraction of the spleen, but also others which cause dilatation.

There is no evidence that the vagi contain any centrifugal fibres which influence the volume of the spleen (contrary to Roy). Provided their inhibitory action upon the heart is neutralised by atropine, even the strongest stimulation of the peripheral end of either cut vagus produces no direct effect upon the spleen.

There is evidence of the existence of numerous afferent (sensory) fibres in the nerves supplying the spleen.

Entomological Society, February 19.—Prof. Raphael Meldola, F.R.S., President, in the chair.—Dr. D. Sharp, F.R.S., exhibited preparations of *Dytiscus latissimus* and *Cybister roeselii*, to show the so-called secondary wing, noticed by Meinert. He stated that this structure is only a part of the elytron, to which it is extensively attached, and that he considered that it corresponded with the angle at the base of the wing seen in so many insects that fold their front wing against the body. He could not consider that this structure afforded any support to the view that the elytra of beetles correspond with the tegulae of Hymenoptera rather than with the front wings. He also exhibited specimens of Neuroptera, and pointed out that this secondary wing agreed in position and structure with a small lobe on the front wing of Raphidia. Mr. McLachlan, Prof. Meldola, and Mr. Gahan made some remarks on the subject.—Mr. C. G. Barrett exhibited, for Dr. H. G. Knaggs, cells of *Retinia resinana* formed of resin but lined with wax. A portion of the cell had been removed and the resin dissolved away with spirit, leaving a slight film of wax. Mr. Tutt stated that a secretion of wax had been detected by Dr. Chapman in *Parnassius apollo*. Prof. Meldola suggested that as Dr. Knaggs had shown how to separate the resin from the wax, it would be of interest to make a chemical investigation of the latter, since a sufficient supply of this material could easily be obtained. No insect wax, with the exception of that of the bee, had been submitted to investigation by chemists. Mr. Hampson and Mr. Blandford continued the discussion.—Mr. Gahan exhibited drawings of the dorsal segments of the abdomen of *Dyscritina longisetosa*, formerly described by Prof. Westwood in *Trans. Ent. Soc.*, 1881, a specimen of which was shown by Mr. E. E. Green at the last meeting of the Society. He regretted that no drawing, showing the ventral service, had yet been prepared.—Mr. B. A. Bower exhibited specimens of *Argyresthia atmoriella*, Banks, taken in Kent, in June 1894, a recent addition to British Lepidoptera.—Mr. Green read notes on the habits of the Indian ant, *Ecophylla smaragdina*, Fabr. He said he believed that at some previous meeting of the Society, Mr. Ridley, of the Singapore Museum, made some remarks on this ant and its supposed habit of using its own larvæ as web-spinners in the formation of its nest, but he had not been able to find anything on the subject in the *Proceedings*. Mr. Green stated that he was now able to produce corroborative evidence from an independent source. The facts were noted by his friend Mr. W. D. Holland, of Balangoda, Ceylon, a most careful observer. Mr. Green exhibited the specimens referred to by Mr. Holland, and pointed out that the larvæ were still tightly grasped by the jaws of the ants, and he thought it probable that other web-spinning ants utilised their larvæ in the same way. Mr. Hampson said he could confirm this statement.—Mr. G. F. Scott-Elliott read a paper entitled “Notes on Flower-Haunting Diptera.” The author pointed out that some of the higher types of Diptera

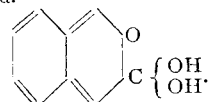
appeared to prefer red and blue flowers, and more often visited the complicated types of plants than the smaller Hymenoptera. He also alluded to the effect of insect visitors in isolating particular individuals. Prof. Meldola stated that although he was aware, from the writings of Hermann Müller and others, that Diptera played an important part in the fertilisation of flowers, he was unaware of the very great importance which these insects possessed for the function of pollination until he heard Mr. Scott-Elliott's paper. He also called attention to the urgent need of a manual of British Diptera. Mr. R. Trimen, F.R.S., mentioned that in South Africa some species of Orchidaceæ were fertilised by Diptera. Dr. Sharp said Prof. Plateau thought that neither the colour nor form of the flower played any part in attracting insects. Mr. McLachlan remarked that the flowers of *Scrophularia* possessed a great attraction for wasps. Lord Walsingham, F.R.S., inquired whether any observation had been made as to the Diptera which visited differently coloured flowers of the same species, such as *Petunias*. Mr. Barrett, Mr. Green, and Mr. Scott-Elliott continued the discussion.—Mr. Tutt read a paper, by Prof. A. Radcliffe-Grote, entitled "On the Nomenclature of the Geometridæ."—A discussion on the rules of nomenclature followed, in which Lord Walsingham, Prof. Meldola, Mr. Hampson, and Herr Jacoby took part.

Royal Meteorological Society, February 19.—Mr. Edward Mawley, President, in the chair.—The report on the phenological observations for 1895 was presented by Mr. Mawley, in which it was shown that, owing to the great frost at the beginning of the year, all the first spring flowers made their appearance very late; and it was not until the middle of June that plants began to come into blossom in advance of their usual time. During July the dates recorded were, as a rule, exceptionally early. The yield of all the farm crops, except potatoes, was exceedingly poor. Pears and plums yielded badly, but there was a splendid crop of apples, and also of all the small fruits. As regards vegetation generally, seldom has a year ended under conditions as favourable for the one succeeding it.—Mr. R. H. Scott, F.R.S., read a paper on the recent unusually high barometer readings in the British Isles, in which he stated that the Daily Weather Chart for 6 p.m. on January 8, was the first in these islands that ever showed 31 inches. The station was Stormoway, and by the next morning all over the northern portions of Great Britain and Ireland the barometers were above 31 inches. The highest reading of all was 31.119 inches, photographically recorded at Glasgow at 9 a.m. on the 9th. The barometric pressure then gave way, and the region of highest readings moved southwards along our west coast, and finally left the south of Ireland on the 15th. Weather throughout the period was mild, an unusual thing with a very high barometer. At the end of the month a second anticyclone spread over the country, when the barometer rose to 30.96 inches at Cork. Reference was made to previous excessively high barometer readings in England and in Siberia, and it was stated that a reading of 31.62 inches at Barnaul in Siberia, in 1877, was probably the highest ever observed.—Mr. R. Inwards read a paper on Turner's representations of lightning, which he considered to be true to nature, and demonstrated the same by placing an actual example of Turner's work side by side with a photograph of a real flash of lightning.

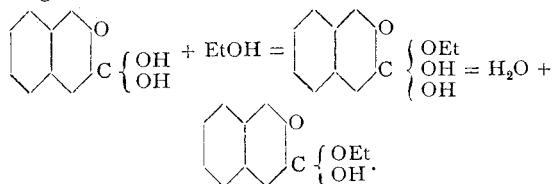
Linnean Society, February 20.—Mr. C. B. Clarke, F.R.S., President, in the chair.—Mr. Clement Reid exhibited a collection of acorns planted by rooks, and made remarks upon the agency of these and other birds in the dispersal of seeds. A discussion followed, in which the President and Messrs. Cole, Druery, Harting, and Kirby took part.—Mr. Bernard Arnold exhibited and made remarks upon an abnormal growth of *Dactylis glomerata*, Linn., gathered at Shorne, near Gravesend, criticisms being offered by Messrs. B. Daydon Jackson and H. Groves.—Mr. W. H. Lang exhibited under the microscope some prothalli of several varieties of *Nephrodium Filix-mas*. These illustrated the apogamous production of the sporophyte which has been described in this species by De Bary and Kny. Dr. D. H. Scott and Mr. C. T. Druery took part in the discussion which followed.—On behalf of Mr. John Young there was exhibited an unprecedented case of hybridism between *Carduelis spinus* and *Linota cannabina*, the former being the male parent. Some remarks were made on the subject by Mr. Harting, who took occasion to exhibit, on behalf of Captain M. Murphy, another hybrid, viz. one between black grouse and pheasant, which had been shot near Bunessan, Mull, in the month of

January last.—On behalf of Mr. E. J. Lowe, F.R.S., a paper was read by Mr. Druery in which details were given regarding the culture of divided and redivided prothalli of *Scolopendrium vulgare*. Apart from the fact that by such subdivision and the consequent separation of parts bearing archegonia and antheridia, the oophoric stage of fern life was maintained for a number of years without the sporophoric generation appearing; the ultimate results, when fertilisation eventually took place, were very remarkable. In numerous instances several marginal plants appeared on the same prothallus of presumably the parental type; but single plants originating from the centre of each prothallus were, though of varying character, all distinguished by bearing prothalli upon their edges or terminal points, such prothalli developing root-hairs, archegonia and antheridia, although the young plants had formed a distinct axis of growth and thrown up a circle of such aposporous fronds. The paper embodied also the observations of Mr. C. T. Druery, Prof. F. O. Bower, Prof. Farmer, Dr. Scott, and Mr. Lang on material sent to them, and one of the plants in question, clearly showing the aposporous growths, was exhibited by Mr. Druery in illustration. A discussion followed, in which Dr. Scott, Mr. Lang, and Mr. Druery remarked upon the interesting nature of these and similar breaches of the law of alternation of generations in the Archegoniata.

Chemical Society, February 20.—Mr. A. G. Vernon Harcourt, President, in the chair.—The following papers were read:—The origin of colour, No. XI. The yellow colour of 2:3-hydroxynaphthoic acid, by H. E. Armstrong. The yellow colour possessed by this naphthoic acid and its salts may be readily explained by assigning to it an orthoquinonoid structure of the following kind.



—Note on etherification, by H. E. Armstrong. 2:3-hydroxynaphthoic acid is converted into its ethylic salt more readily than the isomeric α -hydroxynaphthoic acid; an acid having the constitution indicated above should readily combine with alcohol yielding a substance which could easily give the ethylic salt by losing water, thus:—



—The relation of pinene to citrene, by H. E. Armstrong.—The conditions involved in the occurrence of inversion in the case of asymmetric (optically active) compounds, by H. E. Armstrong. The remarkable conversion of dextro- or levo-malic acid into its optical antipodes is possibly due to the formation of a chlorophosphonium compound, which is then acted on by hydrogen chloride giving chlorosuccinic acid and phosphorus oxychloride. The production of naphthalene and of isoquinoline derivatives from dehydracetic acid, by J. N. Collie and N. T. M. Wilsmore. The yellow condensation product obtained from diacetylacetone is a benzene derivative, and condenses with ammonia, giving two isoquinoline bases.—Note on a difficulty encountered in the determination of nitrogen by the absolute method, by W. R. Dunstan and F. H. Carr. Very high values are obtained on determining the nitrogen in acetonitrile by the absolute method; this is shown to be due to the formation of methane during the combustion. Experiments with mixtures of methane and nitrogen show that the hydrocarbon in the diluted state is only burnt with great difficulty by red-hot copper oxide.—Mixed diazomides containing an ortho-nitro-group, by R. Meldola and F. W. Streatfeild.—Allyl-p-dinitrodiazamidobenzene: a study of the relations between melting-point and constitution, by R. Meldola and F. W. Streatfeild.

EDINBURGH.

Royal Society, February 17.—Prof. Copeland in the chair.—Prof. John G. M'Kendrick made five communications. He first described the case of a boy, four and a half years old, who showed a remarkable appreciation of pitch, being able at once to

name any note struck on a piano. Then followed a demonstration of the acoustic turbine of Dvorák and Mayer, and of a flame so sensitive that it was affected by the ticking of a watch. Next, Prof. M'Kendrick exhibited Graham's method of producing a musical tone in a circuit containing a variable resistance apparatus and a telephone. The sound emitted was like that of a cornet or flute. Finally, Prof. M'Kendrick made some further observations on the phonograph. He described apparatus by which the sounds could be magnified, and detailed his methods of studying the curves on the wax cylinder, of which he exhibited photographs. He showed that each note and sound had its characteristic curve, and, to show it, spoke the words "Arrubnide fo Eetisrevenu" into a machine moving backwards, and the meeting was considerably startled to hear, on the instrument being turned in the proper direction, the words coming out "University of Edinburgh."

CAMBRIDGE.

Philosophical Society, February 10.—Prof. J. J. Thomson, President, in the chair.—Exhibition of a method of measuring osmosis at atmospheric pressure, by Dr. Lazarus-Barlow.—Exhibition of specimens showing the communication between the peritoneal cavity and renal veins through the nephrostomial tubules in the frog, by E. J. Bles.—On the effect of currents on the assimilation of water-plants, by F. Darwin and D. F. M. Pertz. The amount of gas given off by water-plants under the influence of light is markedly increased by continuously stirring the water. This holds good in the case of Elodea, but only under certain circumstances with Potamogeton. That form of gas-evolution which continues in darkness, owing to the gas-pressure in the water, is also increased by disturbing the water. The authors described simple methods of showing the effect of barometric pressure and of surface tension on the yield of gas.—On a collection of plants from New Britain (*Neu Pommern*), by I. H. Burkill. This collection was brought home by Baron A. von Hügel, having been made in the neighbourhood of Blanche Bay. There are in it a number of species not hitherto known as natives of New Britain; among them a new *Eranthemum* described as *E. Huegelii*. The name *Alpinia oceanica* is suggested for a plant described by Prof. K. Schumann as *A. nutans*: this being also held as possibly not identical with Rumphius' *Globba sylvestris minor*. The total number of species known from New Britain is still small, two-thirds of them having been found in German New Guinea, and about one-half in the Fiji Isles.

PARIS.

Academy of Sciences, March 2.—M. A. Cornu in the chair.—On the divergence of the series used in astronomy, by M. H. Poincaré. The results obtained by M. Hill are shown to be in agreement with those previously obtained by the author, the contradiction being only apparent.—Observations on the subject of photography through opaque bodies, by M. A. d'Arsonval. In reviewing the work of M. G. Le Bon and his critics, it is shown that their results are not necessarily contradictory. The solar rays do not appear to penetrate a thin plate of metal, even of aluminium; if a plate of glass, however, especially a fluorescent glass, be placed above the metal screen, the photographic plate is affected.—On the invisible radiations emitted by phosphorescent bodies, by M. Henri Becquerel. The light emitted by crystals of uranyl-potassium sulphate, $K(UO)_2SO_4 + H_2O$, can pass both through thin sheets of metal and also through black paper. This effect was first shown by covering a sensitive film with a metal screen, placing some crystals of the double sulphate on this, and then exposing to sunlight. But it was afterwards found that the crystals exerted the same photographic effect in the dark, a phenomenon which can hardly be attributed to phosphorescence, since $\frac{1}{100}$ th of a second after exposure to light, these radiations are no longer visible (see p. 445).—The relation between the energy of muscular work and albuminoids in food, by MM. A. Chauveau and C. Contejean. The albuminoids in food are not directly concerned with the production of muscular energy, since the amount of nitrogen excreted in the urine is independent of the work done by the animal.—Observations on the Comet Perrine (1895 c), made at the Observatory of Toulouse with the Brunner equatorial, by M. F. Rossard.—On a means of recognising small variations in the rate of astronomical clocks, by M. G. Bigourdan. The use of a free pendulum, working in a vacuum at a constant temperature, is suggested.—On groups of operations, by M. Levassieur.—Reply to the observations of M. H. Poincaré on the theory

of the kathode rays, by M. G. Jaumann.—Observations on the subject of the preceding communication, by M. H. Poincaré. Presentation of prints obtained by M. Röntgen's method, by M. Londe.—Dark light, a reply to some criticisms, by M. Gustave Le Bon.—Diffusion of the Röntgen rays, by MM. A. Imbert and H. Bertin Sans. The experiments show that if the rays are regularly reflected, it must be only to a very small extent; they can, however, be readily diffused, and the diffusion appears to depend rather on the nature than on the condition of the surface of the diffusing body.—On the photographic representation of a medal obtained by the Röntgen rays, by M. J. Carpentier.—On the passage of the Röntgen rays through liquids, by MM. Bleunard and Labesse. Water, either coloured or not, and solutions of borax and potassium permanganate are transparent to the rays. Solutions of potassium bromide, antimony chloride, and potassium bichromate, on the other hand, are not so transparent.—Discovery and extraction of a needle embedded in the hand by means of the Röntgen rays, by M. P. Delbet.—Applications of the method of Röntgen, by MM. C. Girard and F. Bordas.—Extraction of rhodinol from the essence of pelargonium and from essence of roses; identity of these two alcohols, by MM. P. Barbier and L. Bouveault.—On the preparation of silicochloroform, silicobromoform, and on some derivatives of triphenyl-silicoprotane, by M. C. Combes. Silicide of copper, prepared in the electric furnace, and containing 20 per cent. of silicon, is heated in a current of dry HCl to the boiling point of diphenylamine. The liquid obtained consists of silicochloroform (80 per cent.) and silicon tetrachloride (20 per cent.), readily separated by fractional distillation. In this way there is no difficulty in preparing 1 kilo. of silicochloroform at one operation.—Oxidation of crotonic aldehyde, by M. E. Charon. By careful oxidation with silver oxide only one crotonic acid is produced.—The elements of the retina vibrate transversely, by M. A. Charpentier.—On functional assimilation, by M. F. Le Dantec.—A new function of the tubes of Malpighi, by M. V. Mayet.—Some diseases of the potato, by M. E. Roze.—The Hypostomaceæ, a new family of parasitic fungi, by M. Paul Vuillemin. A description of two new parasitic fungi discovered in the needles of Conifers.—On the inversion of the folds on the two sides of the Atlas of Blida (Algeria), by M. E. Fichet.—On the secondary layers of the provinces of Murcie, Almeria, Grenada, and Alicante (Spain), by M. R. Nickles.—The Observatory of Mount Argoul (Gard), by M. G. Fabre.

PHILADELPHIA.

Academy of Natural Sciences, February 18.—A paper entitled as follows was presented for publication, "Contributions to the Life-history of Plants, No. xii.," by Thomas Meehan. (1) Fecundity of *Heliophyllum Indicum*; (2) origin of the forms of flowers; (3) spines on the Citrus family; (4) flowers and flowering of *Lanum purpureum*; (5) cleistogamy in Umbellifere; (6) rhythmic growth in plants; (7) pellucid dots on some species of Hypericum; (8) honey glands of flowers; (9) varying phyllotaxis in the elm; (10) special features in a study of *Cornus stolonifera*; (11) Folial origin of cauline structures; (12) polarity in the leaves of the Compass and other plants; (13) hybrids in nature; (14) origin and nature of plant glands; (15) nutrition as affecting the forms of plants and their floral organs; (16) some neglected studies.—Mr. D. S. Holman exhibited a new stage for the microscope devised for the purpose of studying large objects and widely-spread preparations. It can be adapted to all instruments provided with square stages, and has a motion of two inches each way.—Preparations of minerals containing diatoms in transverse section, and other microscopic arrangements of diatoms prepared by Mr. John A. Schulze, were exhibited by Mr. F. J. Keeley.—Prof. Edw. D. Cope described specimens of fossil reptilia from the Permian and Trias. They belonged to the order Cotylosauria, which had been described by him in 1879, and was afterwards characterised by Seeley from African types. The order embraces the families Elginiidæ, Pariasauridæ, Pariotichidæ, the distribution and characters of which were dwelt on. New genera of Diadectidæ were described under the names Bolbodon and Diatomodon, the teeth of which, as well as of the other genera of the family, were illustrated. The Platodontia may have been derived from the Diadectidæ. The roof over the temporal fossa and the foramen for the temporal eye were illustrated by specimens. The molar teeth of a species of Empedias, the cranium of *Bolbodon tenuitectis*, and the lower jaw of Diatomodon were

exhibited. Another form, described under the name *Conodectes farvus*, may belong to the Diadectidae, but its relationships are at present uncertain.

GÖTTINGEN.

Royal Society of Sciences.—In the *Nachrichten*, No. 4, 1895 (mathematico-physical section) the following memoirs communicated to the Society are published.

October 19.—J. Orth: Report on the work done in the Göttingen Pathological Institute in the summer half-year 1895.

November 16.—W. Schur: Further communications on the results of pendulum-observations in or near Göttingen.

November 30.—Georg Landsberg: Foundations of the arithmetical theory of the algebraic functions of one variable.—Eduard Riecke: The quantities of electricity concerned in a lightning-flash (43 to 98 coulombs).

DIARY OF SOCIETIES.

LONDON.

THURSDAY, MARCH 12.

ROYAL SOCIETY, at 4.30.—The Croonian Lecture: Observations upon Isolated Nerve: Electrical Changes a Measure of Physico-chemical Change: Dr. A. D. Waller, F.R.S.

MATHEMATICAL SOCIETY, at 8.—On the Enumeration of Groups of Totatives: Prof. Lloyd Tanner.—(1) The Catenary on the Paraboloid and Cone; (2) The Motion of the Top: Prof. Greenhill, F.R.S.

INSTITUTE OF ELECTRICAL ENGINEERS, at 8.—High-Voltage Lamps and their Influence on Central Station Practice: G. L. Addenbrooke.

SOCIETY OF ANTIQUARIES, at 8.30.

CAMERA CLUB, at 8.15.—Lord Armstrong's Experiments in Electric Discharge: Dr. Bowles.

FRIDAY, MARCH 13.

ROYAL ASTRONOMICAL SOCIETY, at 8.—Observations of the Variable Star R Carinae, December 1890 to August 1895: J. Tebbutt.—Discovery and Observations of Comet Brooks (*d* 1895): W. R. Brooks.—Observations of the Variable Stars W. X, and Y Sagittarii: Lieut.-Colonel Markwick.—Elliptical Orbit Elements of Comet 1894 *b* (Gale): Rev. T. Roseby.—Results of Double Star Measures at Windsor, New South Wales, in 1895: J. Tebbutt.—On the Determination of the Errors of the Cape Réseau: David Gill and Harold Jacoby.—Royal Observatory, Edinburgh: Observations of Comets.—Note on Mr. Stone's Paper, "Expressions for the Elliptic Co-ordinates of a Moving Point to the Seventh Order of Small Quantities": Prof. E. W. Brown.—Fireball of 1895, November 22: W. F. Denning.—On the Systematic Errors of Measures of Photographic Plates: Prof. H. H. Turner.—Note on the Zodiacal Light as seen at Oxford, 1896, March 4: Prof. H. H. Turner.—Variation of T Centauri: A. W. Roberts.—Royal Observatory, Greenwich: Results of Micrometer Measures of Double Stars made with the 28-inch Refractor in the Years 1894 and 1895.

PHYSICAL SOCIETY, at 5.—An Addition to the Wheatstone Bridge for the Determination of Low Resistances: J. H. Reeves.—A Communication on Kathode Rays: Herr Puluj.

MALACOLOGICAL SOCIETY, at 8.

INSTITUTE OF CIVIL ENGINEERS, at 8.—Tests of Centrifugal Pumps: J. C. Cornock.

SATURDAY, MARCH 14.

ROYAL INSTITUTION, at 3.—Light: Lord Rayleigh, F.R.S.

ROYAL BOTANICAL SOCIETY, at 3.45.

ESSEX FIELD CLUB (at Loughton).—Demonstration Meeting.—Mosses and Scale Mosses (Muscinæ): G. M. Holmes and E. D. Marquand.

MONDAY, MARCH 16.

ROYAL GEOGRAPHICAL SOCIETY, at 4.30.—On the Maps used by Herodotus: John L. Myres.

VICTORIA INSTITUTE, at 4.30.—Relations of Mind and Body.

CAMERA CLUB, at 8.15.—The Faroe Islands: K. Grossman.

TUESDAY, MARCH 17.

ROYAL INSTITUTION, at 3.—The External Covering of Plants and Animals: Prof. C. Stewart.

ZOOLOGICAL SOCIETY, at 8.30.—A Contribution to our Knowledge of the Hymenopterous Fauna of Ceylon: Lieut.-Colonel C. T. Bingham.—On British Hydroids and Medusæ: Edward T. Browne.—On some Extinct Fishes of the Teleostean Family Goniorhynchidæ: A. Smith Woodward.

INSTITUTE OF CIVIL ENGINEERS, at 8.—The Lixiviation of Silver Ores: J. H. Clemes.—Mining and Treatment of Copper Ore at Tharsis, Spain: C. F. Courtney.—Tin Smelting at Pulo Brani, Singapore: John McKillop and T. Flower Ellis.

ROYAL STATISTICAL SOCIETY, at 5.—Reformatory and Industrial Schools: John Watson.

ROYAL PHOTOGRAPHIC SOCIETY, at 8.—Screens for Process Work; and a Note on Photogravure: Captain Collard.

ROYAL VICTORIA HALL, at 8.30.—Gold Mining: Dr. T. K. Rose.

WEDNESDAY, MARCH 18.

SOCIETY OF ARTS, at 8.—Bahamas Sisal Industry: Dr. D. Morris, C.M.G. ROYAL METEOROLOGICAL SOCIETY, at 7.30.—Weather Forecasts and Storm Warnings: F. Gaster.

ROYAL MICROSCOPICAL SOCIETY, at 8.—American Rotifera: Dr. A. C. Stokes.

ENTOMOLOGICAL SOCIETY, at 8.—Classification of Three Sub-families of Moths of the Family Pyralidæ: the Epipaschiinæ, Endotrichinæ, and Pyralinæ: George Francis Hampson.—Descriptions of New Oriental Scolytidæ: Walter F. H. Blandford.

THURSDAY, MARCH 19.

ROYAL SOCIETY, at 4.30.

SOCIETY OF ARTS (Imperial Institute), at 8.30.—The Great Landslip at Gohna, in Gurhwal, and the Measures adopted to prevent Serious Loss of Life: J. H. Glass, C.I.E.

LINNEAN SOCIETY, at 8.—On the Structure of the Female Flowers and Fruit of *Sararanga*, Hemsl (Pandanaeae): Dr. A. Stapf.—On Two Little-known Opisthoglyphous Snakes: G. S. West.

CHEMICAL SOCIETY, at 8.—The Constitution of a New Organic Acid: H. J. H. Fenton.—The Volume and Optical Relationships of the Monoclinic Series of Double Sulphates $R_2M(SO_4)_2 \cdot 6H_2O$: A. E. Tutton.

SOCIETY OF ANTIQUARIES, at 8.30.

CAMERA CLUB, at 8.15.—Views in Cashmere: G. Millais.

FRIDAY, MARCH 20.

ROYAL INSTITUTION, at 9.—Immunisation against Serpents' Venom and the Treatment of Snake-Bite with Antivenene: Prof. T. R. Fraser, F.R.S.

EPIDEMIOLOGICAL SOCIETY, at 8.—On Puerperal Mortality: a Statistical and Etiological Inquiry: Dr. Williams.—An Outbreak of Typhoid Fever in Beyrouth, Syria: Dr. Wortabet.

QUEKETT MICROSCOPICAL CLUB, at 8.

SATURDAY, MARCH 21.

ROYAL INSTITUTION, at 3.—Light: Lord Rayleigh, F.R.S.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

BOOKS.—By Meadow and Stream: The Amateur Angler (S. Low).—Intensity Coils, 17th edition (Perken).—Alternating and Interrupted Electric Currents: Prof. G. Forbes (Biggs).—Physical Units: Dr. M. Maclean (Biggs).—Hypnotism, Mesmerism, and the New Witchcraft: E. Hart, new edition (Smith).—Les Fermentations: P. Schützenberger, sixième édition (Paris, Alcan).—The New Photography: A. B. Chatwood (Downey).—The Story of the Nations: The West Indies and the Spanish Main: J. Rodway (Unwin).—Leçons sur la Cellule, Morphologie et Reproduction: L. F. Henneguy (Paris, Carré).—Mechanics for Beginners: W. Gallatly (Macmillan).—The Number Concept: Dr. L. L. Conant (Macmillan).—An Elementary Treatise on Rigid Dynamics: W. J. Loudon (Macmillan).—Electric Wiring: R. Robb (Macmillan).—Griffin's Electrical Engineer's Price-Book, new edition, Edited by H. J. Dowling (Griffin).

PAMPHLETS.—Zur Mechanik des Vogelfluges: Dr. Fr. Ahlborn (Hamburg).—Preliminary Report on the Tsetse Fly Disease, or Nagana, in Zululand: Surgeon-Major D. Bruce (Durban).—How to Assist the Sight (J. H. Steward).

SERIALS.—Bulletin of the American Mathematical Society, February (New York, Macmillan).—Geographical Journal, March (Stanford).—Journal of the Royal Microscopical Society, February (Williams).—Psychological Review, Monograph Supplement. No. 2. Association: M. W. Calkins (Macmillan).—Science Progress, March (Scientific Press).—Revue de l'Université de Bruxelles, Nos. 1 and 2 (Bruxelles).—Proceedings of the Physical Society, March (Taylor).—Engineering Magazine, March (Tucker).

CONTENTS.

PAGE

A Glacial Handbook. By Prof. Grenville A. J. Cole	433
Philosophy and Evolution. By A. R. W.	435
Our Book Shelf:—	
MacDougal: "Experimental Plant Physiology"	436
Austin and Thwing: "Exercises in Physical Measurement"	436
Letters to the Editor:—	
The Age of the Wealden.—Prof. O. C. Marsh	436
The Röntgen Rays.—Ralph R. Lawrence; Prof. Silvanus P. Thompson, F.R.S.; J. D. Cormack and Herbert Ingle; G. H. P.	436
The Aurora at Waterford.—Dr. M. F. O'Reilly	437
An Unusual Meteor.—J. Edmund Clark	437
Recent Work of the Geological Survey of the United States. I.	437
Ostwald's Energetics. By Prof. Geo. Fras. Fitzgerald, F.R.S.	441
The Highlands of Peru. (<i>Illustrated.</i>)	442
Sekiya Seikei. By J. M.	443
Notes.	443
Our Astronomical Column:—	
Perrine's Comet (1895)	447
Comet Perrine-Lamp	448
Orbit of δ Cephei	448
The Absolute Velocity of 61 Cygni	448
On the Appearance of the Spectral Lines of Clevite Gas in Stellar Spectra	448
The Röntgen Rays	449
On the Generation of Longitudinal Waves in Ether. (<i>With Diagram.</i>) By Lord Kelvin, F.R.S.	450
University and Educational Intelligence	451
Scientific Serials	452
Societies and Academies	453
Diary of Societies	456
Books, Pamphlets, and Serials Received	456